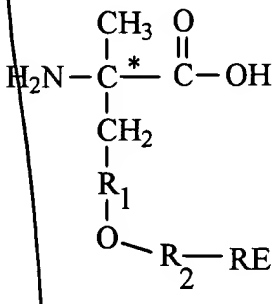
We claim:

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof:

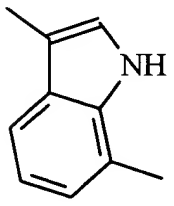


(I)

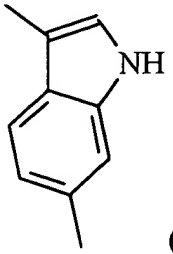
wherein

the C marked with an asterisk represents a chiral center and the compound is present in the L-form, the D-form or as a racemic mixture;

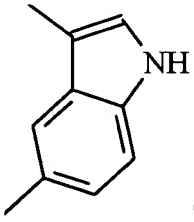
R_1 is selected from the group consisting of a single bond, phenyl, and a group of formula (a), (b), (c) or (d)



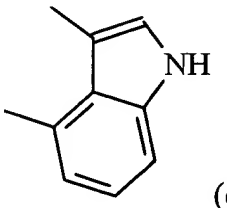
(a),



(b),



(c),



(d);

R_2 is C_1-C_7 alkyl; and

RE is selected from the group consisting of ^{75}Br, ^{124}I and ^{18}F.

2. The compound of claim 1, wherein R_1 is a single bond.

3. The compound of claim 1, wherein R_1 is phenyl.

4. The compound of claim 3, wherein the -O-R_2-RE group is *para* the CH_2 group on the phenyl.

5. The compound of claim 3, wherein the -O-R_2-RE group is *meta* the CH_2 group on the phenyl.

6. The compound of claim 3, wherein the -O-R_2-RE group is *ortho* the CH_2 group on the phenyl.

7. The compound of claim 1, wherein R_1 is a group of formula (a), (b), (c) or (d).

8. The compound of claim 1, wherein R_2 is C_2-C_6 alkyl.

9. The compound of claim 1, wherein R_2 is C_2-C_5 alkyl.

10. The compound of claim 1, wherein the compound is present in the L-form.

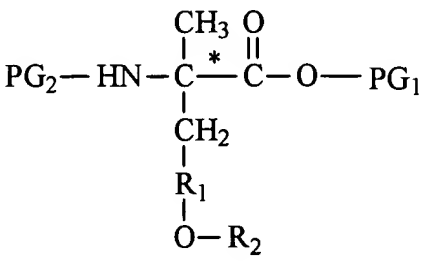
11. The compound of claim 1, wherein the compound is present in the D-form.

12. The compound of claim 1, wherein the compound is present as a racemic mixture.

13. The compound of claim 1, wherein the compound is 3-[^{18}F]fluoro(C_2-C_6)-α-methyl tyrosine.

14. The compound of claim 13, wherein the compound is 3-[^{18}F]fluoropropyl-α-methyl tyrosine.

15. A compound of formula (II):

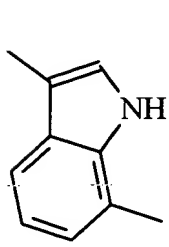


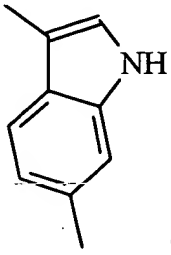
(II)

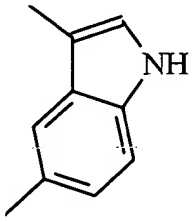
wherein

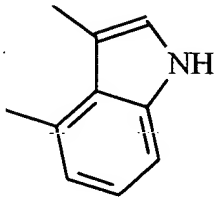
the C marked with an asterisk represents a chiral center and the compound is present in the L-form, the D-form or as a racemic mixture;

R_1 is selected from the group consisting of a single bond, phenyl, and a group of formula (a), (b), (c) or (d)



(a),


(b),


(c),


(d);

R_2 is H or a group $-R_3-O-R_4$, wherein R_3 is C_1-C_7 alkyl and R_4 is H or a leaving group;

PG_1 is a carboxyl protecting group; and

PG_2 is an amino protecting group.

16. The compound of claim 15, wherein PG_2 is a Boc group.

17. The compound of claim 15, wherein PG_1 is C_1-C_3 alkyl.

18. The compound of claim 15, wherein R_1 is a single bond.

19. The compound of claim 15, wherein R_1 is phenyl.

20. The compound of claim 19, wherein the $-O-R_2$ group is *para* the CH_2 group on the phenyl.

21. The compound of claim 19, wherein the $-O-R_2$ group is *meta* the CH_2 group on the phenyl.

22. The compound of claim 19, wherein the -O-R_2 group is *ortho* the CH_2 group on the phenyl.

23. The compound of claim 15, wherein R_1 is a group of formula (a), (b), (c) or (d).

24. The compound of claim 15, wherein R_2 is H.

25. The compound of claim 15, wherein R_2 is a group -R_3-O-R_4.

26. The compound of claim 25, wherein R_3 is C_2-C_6 alkyl.

27. The compound of claim 25, wherein R_3 is C_2-C_5 alkyl.

28. The compound of claim 25, wherein R_4 is H.

29. The compound of claim 25, wherein R_4 is a sulfonyl group.

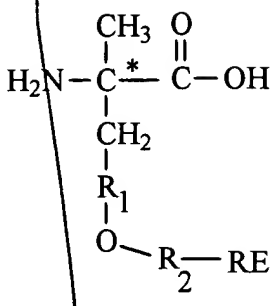
30. The compound of claim 29, wherein R_4 is selected from the group consisting of tosyl, trifyl, mesyl, trimsyl, tripsyl, brosyl and nosyl.

31. The compound of claim 30, wherein R_4 is selected from the group consisting of tosyl, trifyl and mesyl.

32. The compound of claim 31, wherein R_4 is tosyl.

33. The compound of claim 32, wherein R_3 is propyl.

34. A method of synthesizing a compound of formula (I):

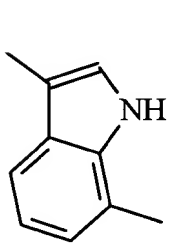


(I)

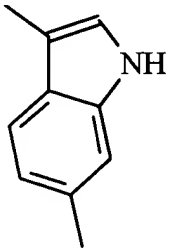
wherein

the C marked with an asterisk represents a chiral center and the compound is present in the L-form, the D-form or as a racemic mixture;

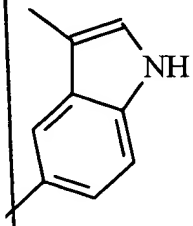
R_1 is selected from the group consisting of a single bond, phenyl, and a group of formula (a), (b), (c) or (d)



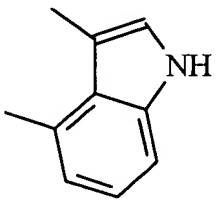
(a),



(b),



(c),



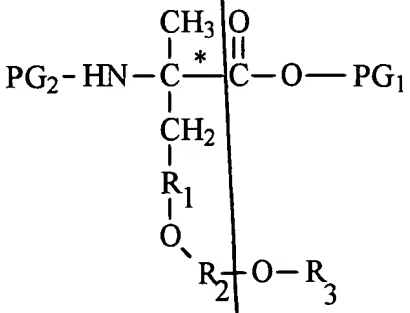
(d);

R_2 is C_1-C_7 alkyl, and

RE is selected from the group consisting of ^{75}Br, ^{124}I and ^{18}F,

the process comprising the following steps:

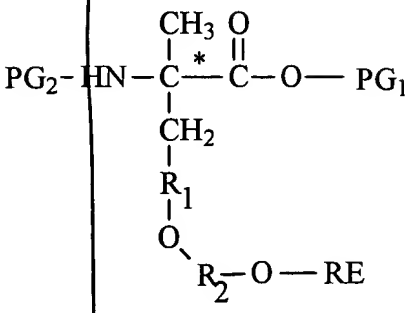
(1) reacting a compound of formula (IIc):



(IIc)

wherein R_1 and R_2 are the same as above, R_3 is a leaving group, PG_1 is a carboxyl protecting group and PG_2 is an amino protecting group,

with a salt of RE, wherein RE is the same as above, to produce a compound of formula (Ia):



(Ia)

wherein R_1, R_2, RE, PG_1 and PG_2 are the same as above; and

(2) removing the protecting groups.

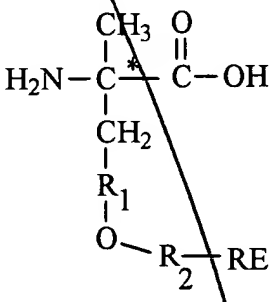
35. The method of claim 34, wherein R_3 is selected from the group consisting of tosyl, trifyl, mesyl, trimsyl, tripsyl, brosyl and nosyl.

36. The method of claim 35, wherein R_3 is selected from the group consisting of tosyl, trifyl and mesyl.

37. The method of claim 36, wherein R_3 is tosyl.

38. A method of imaging a tumor in a patient using positron emission tomography (PET) or single photon emission computed tomography (SPECT) imaging, the method comprising

administering to the patient a tumor imaging effective amount of a compound of formula (I), or a pharmaceutically acceptable salt thereof:

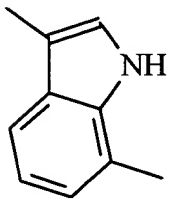


(I)

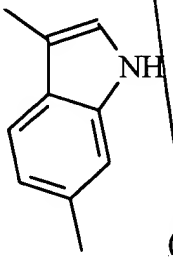
wherein

the C marked with an asterisk represents a chiral center and the compound is present in the L-form, the D-form or as a racemic mixture,

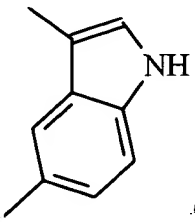
R_1 is selected from the group consisting of a single bond, phenyl, and a group of formula (a), (b), (c) or (d)



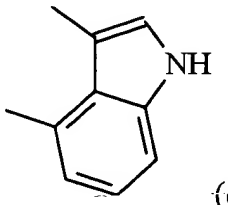
(a),



(b),



(c),



(d),

R_2 is C_1-C_7 alkyl, and

RE is selected from the group consisting of ^{75}Br, ^{124}I and ^{18}F; and

imaging the tumor using PET or SPECT imaging.

39. The method of claim 38, wherein the tumor is selected from the group consisting of brain, breast, prostate, colon, lung, liver, pancreas, gastric, lymphoma, uterine, cervical, extremitis, sarcoma and melanoma.